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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,766	12/23/2004	Yasuhiro Kobayashi	103213-00103	6790

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EXAMINER	
MANDEVILLE, JASON M	

ART UNIT	PAPER NUMBER
2609	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/517,766	KOBAYASHI ET AL.	
	Examiner	Art Unit	
	Jason M. Mandeville	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☒ Claim(s) *7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 December 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/23/2004*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figures 5, 6, 7, and 8 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification Objections

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: **A Gate Driver for an Active Matrix Liquid Crystal Display Device**.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 1-7** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Independent **claim 1**, from which **claims 2-7** are dependent, recites a selection voltage feed circuit that has "a first power source for feeding a predetermined selection voltage and a second power source for feeding a voltage lower than the predetermined selection voltage, the output point of the selection voltage feed circuit is always fed with the voltage from the second power source...." Dependent **claim 2** and Figures 1, 3, and 4 teach that the second power source is connected "via a diode" to the output point of the selection voltage feed circuit. The disclosure is not enabling to one of ordinary skill in the art because the amount of direction provided by the inventor does not support the claim that "the output point of the selection voltage feed circuit is always fed with the voltage from the second power source." In reference to Figures 1, 3, and 4, the output point of the voltage feed circuit is only fed with the voltage from the second power source during the periods in which the switch (20) is "open" (i.e., not conducting

the first power source), the first power source is in an "off" state, or the first power source is at a lower voltage than the second power source.

Because the second power source is connected "via a diode" to the output of the selection voltage feed circuit, the second power source will only be fed to the output of the selection voltage feed circuit when the voltage at the anode of the diode is higher than the voltage at the cathode of the diode. Since the first power source is said to be "feeding a predetermined selection voltage" and the second power source is said to be "feeding a voltage lower than the predetermined selection voltage", the voltage from the second power source will be isolated by the diode, or switched off, from the output of selection voltage feed circuit when the voltage from the first power source is applied by the switch (20).

In addition, the following prior art based rejections are made under the assumption that the issue of enablement in **claims 1-7** is resolved and the limitation that "the output point of the selection voltage feed circuit is always fed with the voltage from the second power source" is deleted from **claim 1**.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. **Claims 1-3, 5, and 6** are rejected under 35 U.S.C. 102(e) as being anticipated by Hyun Chang Lee (hereinafter "Lee"; US 7,002,542).

7. As pertaining to **claim 1**, Lee discloses an active matrix type liquid crystal display device (see Fig. 4; Col. 4, Ln. 53) comprising:

pixel electrodes that are arranged in a matrix (30) and that are driven by pixel transistors (31) respectively (Col. 3, Ln. 38-51);

a plurality of gate lines (GL1-GLn) that are connected, in a column-by-column fashion, to gate electrodes (31) of the pixel transistors (Col. 3, Ln. 38-51);

a plurality of source lines (SL1-SLm) that are connected, in a row-by-row fashion, to source electrodes (31) of the pixel transistors (Col. 3, Ln. 38-51);

a gate driver (34) that, sequentially during one selection period after another (Col. 5, Ln. 2-8; the selection period is equivalently referred to as the "horizontal synchronous interval"), connects one of the gate lines (GL1-GLn) after another to an output point (SVL) of a selection voltage feed circuit (42); (Col. 5, Ln. 2-8; Col. 5, Ln. 58-64; the selection voltage feed circuit is equivalently referred to as "the high level gate voltage generator").

and a source driver (32) that feeds an image signal to the source lines (Col. 1, Ln. 13-18; Col. 4, Ln. 53-58; the source driver is equivalently referred to as the "data driver"),

wherein (see Fig. 12 and Fig. 13) the selection voltage feed circuit (42) has a first power source (VDD1; the power source is internal to (54); Col. 10, Ln. 6-17) for feeding a predetermined selection voltage (VDD1 portion of SCS in Fig. 13; Col. 10, Ln. 6-17) and a second power source (VDD2; the power source is internal to (54); Col. 10, Ln. 6-17) for feeding a voltage lower than the predetermined selection voltage (VDD2 portion of SCS in Fig. 13; Col. 10, Ln. 6-17), the output point of the selection voltage feed circuit (42) is always fed with the voltage from the second power source (VDD2 portion of SCS in Fig. 13; Col. 10, Ln. 17-23; the second power source VDD2 is fed to the output point of the selection voltage feed circuit (42) in an equivalent manner to that of the second power source shown in the applicant's invention, specifically in Figures 1, 3, and 4; see 35 USC § 112 rejection above), and a switch (60) is provided that so operates that, during a time span that starts at a beginning of every selection period and lasts shorter than the selection period (Col. 5, Ln. 5-18; Col. 10, Ln. 23-36; note that in Col. 10, Ln. 23-36 the switch (60) is incorrectly referred to as switch (58)), the output point of the selection voltage feed circuit (Vgh in 42) is fed with the voltage from the first power source (see SCS in Fig. 13).

8. As pertaining to **claim 2**, Lee discloses the active matrix type liquid crystal display device of claim 1 (see Fig. 12 and Fig. 14), wherein the second power source

(VDD2) is connected via a diode (Q2) to the output point of the selection voltage feed circuit (Vgh). (The circuit of Fig. 14 shows that the second power source VDD2 is connected to Vgh via a transistor Q2. Just as a diode operates on the basis of a pn junction in which current flows in only one direction, the transistor Q2 contains a pn junction between the emitter and the base and between the base and the collector. As such, see Col. 11, Ln. 23-58, Q2 inherently functions as a diode.)

9. As pertaining to **claim 3**, Lee discloses the active matrix type liquid crystal display device of claim 2 (see Fig. 12), wherein the first power source (VDD1) is connected via the switch (60) to the output point of the selection voltage feed circuit (Vgh; Col. 10, Ln. 23-29).

10. As pertaining to **claim 5**, Lee discloses the active matrix type liquid crystal display device of one of claims 1 to 3 (see Fig. 4 and Fig. 12), wherein the selection voltage feed circuit (42) is provided separately from the gate driver (34). (Fig. 4 and Fig. 12 clearly show the selection voltage feed circuit (42) is separate from the gate driver (34). See Col. 4, Ln. 53-58; Col. 5, Ln. 40-53).

11. As pertaining to **claim 6**, Lee discloses the active matrix type liquid crystal display device of one of claims 1 to 3 (see Fig. 4 and Fig. 12), wherein the selection voltage feed circuit (42) is arranged, along with a low-level gate voltage source (40), outside the gate driver (34). (Fig. 4 and Fig. 12 clearly show the selection voltage feed

circuit (42) along with the low-level gate voltage source (40) are separate from the gate driver (34). See Col. 4, Ln. 53-58; Col. 5, Ln. 40-53).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. **Claim 2** is also rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US 7,002,542).

Lee discloses the active matrix type liquid crystal display device of claim 1 (see Fig. 4, Fig. 12, and Fig. 14) wherein the second power source (VDD2) is connected to the output point (Vgh) of the selection voltage feed circuit (42). However, Lee does not explicitly state that the second power source (VDD2) is connected to the output point of the selection voltage feed circuit (42) "via a diode."

Lee does disclose (see Fig. 14) that the second power source (VDD2) is connected to the output point (Vgh) of the selection voltage feed circuit (42) via a

transistor (Q2). A diode operates on the basis of a pn junction in which current is allowed to flow in only direction. The transistor Q2 contains a pn junction between the emitter and the base and between the base and the collector. As such (see Col. 11, Ln. 23-58), Q2 inherently functions as a diode. Therefore, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to replace the transistor Q2 taught by Lee with a diode.

14. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US 7,002,542) in view of Kubota et al. (hereinafter "Kubota" US 5,748,165).

Lee discloses the active matrix type liquid crystal display device of one of claims 1 to 3 (see Fig. 4, Fig. 12). However, Lee does not teach that the pixel transistors are formed of amorphous silicon.

Kubota discloses an active matrix liquid crystal display device (see Fig. 20) in which amorphous silicon TFT pixel transistors are utilized to lower power consumption in the display (Col. 3, Ln. 42-45; Col. 26, Ln. 8-17). It would have been obvious to one of ordinary skill in the art at the time when the invention was made to combine the active matrix liquid crystal display taught by Lee with the teachings of Kubota, in which the pixel transistors in the active matrix liquid crystal display are made from amorphous silicon, in order to lower power consumption in the display.

Allowable Subject Matter

15. **Claim 7** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter: none of the prior art that has been found teaches or fairly suggests a combination or a modification of the cited prior art so as to arrive at the limitations of **claim 7**; namely the active matrix liquid crystal display of one of claims 1 to 3, wherein, as the switch, a plurality of switches are provided one for each gate line, in parallel with one another.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lee (US 6,421,038) teaches an active matrix liquid crystal display including a plurality of transistor switches provided on each gate line.

Suzuki et al. (US 5,587,722) teaches a method of generating the step gate waveform used in applicant's invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Mandeville whose telephone number is 571-270-3136. The examiner can normally be reached on Monday through Friday 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexander Eisen can be reached on 571-272-7687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jason M. Mandeville
Examiner
09 April 2007
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